

Application Serial No. 09/673,680

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Reply to Office Action dated March 19, 2004

Listing of the Claims:

1. (Currently Amended) A thermal decomposition apparatus for wastes comprising:

a heating chamber for heating the wastes;

an inlet port for introducing the wastes into said heating chamber;

at least one pair of electrodes provided within said heating chamber;

a light emitting heater consisting of a plurality of balls which contain carbon as a main ingredient, said light emitting heater being provided between said at least one pair of electrodes so as to produce an electric discharge when a voltage is applied across said at least one pair of electrodes; and

an outlet port for discharging substantially harmless gases out of said heating chamber;

wherein the wastes have been thermally decomposed into the substantially harmless gases and further comprising means for decompressing said heating chamber such that said plurality of balls are placed in a vacuum.

2. (Cancelled.)

3. (Cancelled.)

4. (Previously Presented) The thermal decomposition apparatus according to claim 1, wherein said plurality of balls are each made of a material selected from the group consisting of charcoal, graphite, a carbon composite material, and mixtures thereof.

5. (Previously Presented) The thermal decomposition apparatus according to claim 1, wherein each of said plurality of balls is impermeable.

6. (Previously Presented) The thermal decomposition apparatus according to claim 1, wherein said plurality of balls each take the form of a sphere.

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7. (Previously Presented) The thermal decomposition apparatus according to claim 1, further comprising means, provided within said heating chamber, for pressing the wastes against said plurality of balls.

8. (Previously Presented) The thermal decomposition apparatus according to claim 1, further comprising a filter made of a material selected from the group consisting of active carbon, charcoal, and mixtures thereof.

9. (Previously Presented) The thermal decomposition apparatus according to claim 1, further comprising:

a vacuum meter for measuring the pressure within said heating chamber; and

means for adjusting the pressure within said heating chamber to a predetermined value.

10. (Previously Presented) The thermal decomposition apparatus according to claim 1, further comprising an intervening spacer which contains carbon as a main ingredient, the intervening spacer being placed between said plurality of balls and an inner wall of said heating chamber.

11. (Previously Presented) The thermal decomposition apparatus according to claim 1, wherein at least portions of an inner wall of said heating chamber are placed in contact with said plurality of balls, and wherein at least portions of the inner wall are made of a monolithic refractory material selected from the group consisting of boron nitride, niobium, silicon carbide, boron carbide, magnesium oxide, hafnium oxide, hafnium dioxide, beryllium aluminum oxide, and mixtures thereof.

14. (Previously Presented) The thermal decomposition apparatus according to claim 1, further comprising a decomposed gas harm eliminating device

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for thermally decomposing harmful materials remaining in the decomposed gases into harmless gases, the decomposed gas harm eliminating device comprising:

a decomposed gas heating chamber for heating the decomposed gases;

a decomposed gas inlet port for introducing the decomposed gases into said decomposed gas heating chamber;

at least one pair of second electrodes provided within said decomposed gas heating chamber;

a second light emitting heater consisting of a plurality of second balls which contain carbon as a main ingredient, provided between said at least one pair of second electrodes so as to produce an electric discharge when a voltage is applied across said at least one pair of second electrodes;

a harmless gas outlet port for discharging harmless gases to which the decomposed gases have been rendered; and

a filter comprising a material selected from the group consisting of active carbon, charcoal, and mixtures thereof.

15. (Previously Presented) The thermal decomposition apparatus according to claim 14, wherein said decomposed gas harm eliminating device further comprises:

a second vacuum meter for measuring the pressure within said decomposed gas heating chamber; and

second means for adjusting the pressure within said decomposed gas heating chamber to a predetermined value.

16. (Previously Presented) The thermal decomposition apparatus according to claim 14, wherein said decomposed gas harm eliminating device further comprises a second intervening spacer which contains carbon as a main ingredient, placed at least between said plurality of second balls and the inner wall of said decomposed gas heating chamber.

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17. (Previously Presented) The thermal decomposition apparatus according to claim 14, wherein said decomposed gas harm eliminating device further comprises at least portions of the inner wall of said decomposed gas heating chamber which are placed in contact with said plurality of second balls being made of a monolithic refractory material selected from the group consisting of boron nitride, niobium, silicon carbide, boron carbide, magnesium oxide, hafnium oxide, hafnium dioxide, beryllium aluminum oxide, and mixtures thereof.

18. (Previously Presented) The thermal decomposition apparatus according to claim 14, wherein said decomposed gas harm eliminating device further comprises a second pair of electrodes having at least a part thereof in the form of a rod or horn surrounded by said plurality of second balls.